

**WHAT IS CLAIMED IS:**

1. A process for converting oxygenate to an olefin-containing product, comprising:

introducing oxygenate into a reactor system at plural stages along a flow axis  
5 of a reactor catalyst bed;

contacting said oxygenate with an oxygenate to olefin conversion molecular sieve catalyst under oxygenate to olefin conversion conditions; and

recovering an olefin-containing product which contains a higher proportion of ethylene than a product produced from a process which differs only by introducing  
10 oxygenate at a single stage along a flow axis of the reactor catalyst bed.

2. A process according to claim 1, wherein said oxygenate is selected from the group consisting of methanol and dimethyl ether, said reactor catalyst bed comprises a fluidized bed reaction zone which includes a top portion, a bottom  
15 portion, and an intermediate portion extending between the top portion and the bottom portion, wherein said oxygenate is introduced at a first location at or near the bottom portion of the fluidized bed reaction zone, and at a second location in the intermediate portion of the fluidized bed reaction zone.

3. A process according to claim 2, wherein the oxygenate is introduced into the intermediate portion of the fluidized bed reaction zone at plural locations provided at a plurality of different axial positions in the intermediate portion of the fluidized bed reaction zone.  
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4. A process according to claim 2, wherein the fluidized bed reaction zone is a dense fluid bed, and the oxygenate is introduced into the intermediate portion of the fluidized bed reaction zone at plural locations provided at a plurality of different axial positions in the intermediate portion of the fluidized bed reaction zone.  
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5. A process according to claim 1 wherein said catalyst comprises a molecular sieve selected from the group consisting of ZK-4, ZK-5, zeolite A, zeolite T, chabazite, gmelinite, clinoptilolite, erionite, ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-34, ZSM-35, ZSM-38, ZSM-48, ZSM-50, rho, offretite, ferrierite, levyne, SAPO-17, SAPO-18, SAPO-34, SAPO-43 and SAPO-44.

6. The process according to claim 5 wherein said catalyst comprises a phosphorus-modified molecular sieve.

7. The process according to claim 1 wherein said catalyst comprises a molecular sieve selected from the group consisting of ZSM-34 and SAPO-34.

8. The process according to claim 1 wherein said oxygenate is introduced to said process with a diluent.

9. The process according to claim 1 wherein said oxygenate is introduced to said process with minor amounts of an aromatic co-feed.

10. The process according to claim 1 wherein said reactor system is selected from the group consisting of dense fluidized bed, fast fluidized bed, riser or transport fluid bed, and fixed bed reactors.

11. The process according to claim 1 wherein said reactor system comprises a fluidized bed flow reactor.

12. The process according to claim 2 wherein said oxygenate is introduced directly into the bottom portion of the reaction zone through a bottom grid, and in the intermediate portion of the reaction zone through injectors.

13. The process according to claim 12 wherein the oxygenate is introduced at a plurality of different locations in a plane perpendicular or substantially perpendicular to the axial direction of the reactor vessel.

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14. The process according to claim 12 wherein said bottom grid comprises downstream directed nozzles.

15. The process according to claim 12 wherein said bottom grid comprises upstream directed nozzles.

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16. The process according to claim 12 wherein said intermediate portion injectors are directed upstream.

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17. The process according to claim 12 wherein said intermediate portion injectors are directed downstream.

18. A system for converting oxygenate to an olefin-containing product, comprising:

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a reactor system comprising a reactor catalyst bed;  
means for introducing oxygenate into said reactor system at plural stages along a flow axis of said reactor catalyst bed;

means for contacting said oxygenate with an oxygenate to olefin conversion molecular sieve catalyst under oxygenate to olefin conversion conditions; and

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means for recovering an olefin-containing product which contains a higher proportion of ethylene than a product produced from a process which differs only by introducing oxygenate at a single stage along a flow axis of the reactor catalyst bed; and further,

wherein said catalyst comprises a molecular sieve selected from the group consisting of ZK-4, ZK-5, zeolite A, zeolite T, chabazite, gmelinite, clinoptilolite,

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erionite, ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-34, ZSM-35, ZSM-38, ZSM-48, ZSM-50, rho, offretite, ferrierite, levyne, SAPO-17, SAPO-18, SAPO-34, SAPO-43 and SAPO-44.

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          20.    The system according to claim 18 wherein said reactor catalyst bed  
comprises a fluidized bed reaction zone which includes a top portion, a bottom  
10   portion, and an intermediate portion extending between the top portion and the  
bottom portion, wherein said oxygenate is introduced at a first location at or near the  
bottom portion of the fluidized bed reaction zone, and at a second location in the  
intermediate portion of the fluidized bed reaction zone.

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